Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claims 1-17 (canceled)

Claim 18. (original) A method for determining the rate of degradation of a biopolymer, comprising;

a) enriching a first sample biopolymer pool with stable isotope-labeled monomer;

b) collecting an aliquot of the first sample of biopolymer;

c) measuring the relative abundance of monoisotopic and isotopomeric peaks in the first sample;

d) collecting a second aliquot of the first sample of biopolymer;

e) measuring the relative abundance of monoisotopic and isotopomeric peaks in the second aliquot;

f) calculating the difference between the relative abundance of monoisotopic and isotopomeric peaks measured for the second sample and the first sample;

g) dividing the calculated difference between the relative abundance of monoisotopic and isotopomeric peaks by the time duration between the first and second aliquot and therefrom determining the rate of polymer degradation.

Claim 19. (original) The method of claim 18, wherein the biopolymer is a nucleic acid, a protein, a polypeptide, a peptide, a complex carbohydrate, or a lipid.

Claim 20. (original) The method of claim 19, wherein the nucleic acid is a DNA, a complementary DNA, a ribosomal DNA, a RNA, a transfer RNA, a messenger RNA, or a nuclear RNA.

Claim 21. (original) The method of claim 18, wherein the stable isotope-labeled monomer is a deoxynuclecic acid, a ribonucleic acid, an amino acid, a sugar, or a fatty acid.

Claim 22. (original) The method of claim 18, wherein the biopolymer degradation is measured in an organism, an isolated cell, or a cell free system.

Claim 23. (original) The method of claim 18, wherein the biopolymer is separated to form a group of parent biopolymers.

Claim 24. (original) The method of claim 23, wherein the parent biopolymer is fragmented.

Claim 25. (original) The method of claim 24, wherein the biopolymer is fragmented by means of an enzyme, a chemical means, or physical stress.

Claim 26. (original) The method of claim 25, wherein the enzyme is a protease, a nuclease, or a lipase.

Claim 27. (original) The method of claim 25, wherein the chemical means is cyanogen bromide, or sodium borohydride.

Claim 28. (original) The method of claim 25, wherein the protease is trypsin, chymotrypsin, or papain.

Claim 29. (original) The method of claim 18, wherein the relative abundance of monoisotopic and isotopomeric peaks are corrected for the synthesis of new biopolymer.

Claim 30. (original) The method of claim 29, wherein the relative abundance of newly synthesized biopolymer is determined in a second control sample which has been depleted of unlabeled monomer and incubated with stable isotope-labeled monomer for a time period sufficient for new biopolymer synthesis, the relative abundance of monoisotopic and isotopomeric peaks are determined at the time points used for the first sample; and the difference between the relative abundance of monoisotopic and isotopomeric peaks from the first and second sample is determined.